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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,809	01/15/2002	Ken Shoemaker	2207/12020	4746
25693	7590	04/21/2006	EXAMINER	
KENYON & KENYON LLP RIVERPARK TOWERS, SUITE 600 333 W. SAN CARLOS ST. SAN JOSE, CA 95110			VO, LILIAN	
			ART UNIT	PAPER NUMBER
			2195	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,809

Applicant(s)

SHOEMAKER ET AL.

Examiner

Lilian Vo

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 – 20 are pending.

2. In view of the appeal brief filed on 1/30/06, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ungerer et al., "Multithreaded Processors" (hereinafter Ungerer).

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5. Regarding **claim 1**, Ungerer discloses a multi-threading processor, comprising:

a first instruction fetch unit to receive a first thread and a second instruction fetch unit to receive a second thread (page 334, right column: multiple fetch units);

an execution unit to execute said first thread and said second thread (page 334, right column: multiple execution units); and

a multi-thread scheduler coupled to said first instruction fetch unit, said second instruction fetch unit, and said execution unit (page 334, left column, last paragraph), wherein said multi-thread scheduler is to determine the width of said execution unit (page 334, left column - page 335, right column, 2nd paragraph: "...there is no fixed allocation of threads to execution units... The rename/issue stage simultaneously selects instructions from all issue buffers up to its maximum issue bandwidth (SMT feature)... Page 321, right column, 7th paragraph: full issue bandwidth is utilized by potentially issuing instructions from different threads simultaneously).

With respect to the limitation of multi-thread scheduler determines the width of the execution unit, Ungerer discloses that there is no fixed allocation of threads to the execution units and that the rename/issue stage simultaneously selects instructions from all issue buffers up to its maximum issue bandwidth (page 334, left column - page 335, right column, 2nd paragraph). It is obvious that the width of the execution unit is been taking into consideration by the scheduler because each thread may require more or less bandwidth of the execution unit. Therefore, it would have been obvious for one of an ordinary skill in the art at the time the invention was made to recognize this limitation is taught by Ungerer to fully utilize the available resource for the enhancement of system performance.

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6. Regarding **claim 2**, Ungerer discloses a SMT processor simultaneously exploits coarse and fine-grained parallelism and it uses its resources more effectively (page 332, left column, 3rd paragraph). Ungerer also discloses that SMT “exploits ILP by selecting instructions from any thread that can potentially issue. If one thread has high ILP, it may fill all horizontal slots depending on the issue strategy of the SMT processor. If multiple threads each have low ILP, instructions of several threads can be issued and executed simultaneously (page 324, left column, 2nd paragraph). Therefore it would have been obvious to one of an ordinary skill in the art at the time the invention was made, to recognize that the multi-thread scheduler unit in Ungerer’s system determines whether the execution unit is to execute the first thread and the second thread in parallel depending on the width of the execution unit for effectively utilizing the processor and accelerating both multiprogramming and parallel workloads.

7. Regarding **claim 3**, Ungerer discloses a SMT’s system that can perform instruction-level parallelism (page 324, left column, 2nd paragraph, page 332, left column, 3rd paragraph). It would have been obvious to one of an ordinary skill in the art, at the time the invention was made to consider Ungerer’s system an in-order processor because if one thread has high instruction-level parallelism, it may fill all horizontal slots depending on the issue strategy of the SMT processor (page 324, left column, 2nd paragraph).

8. Regarding **claim 4**, Ungerer discloses the execution unit executes the first thread and the second thread in parallel (page 324, left column, 2nd paragraph).

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9. Regarding **claim 5**, Ungerer discloses the execution unit executes the first thread and the second thread in series (page 324, left column, 2nd paragraph).

10. Regarding **claim 6**, Ungerer discloses the first thread and the second thread are compiled to have instruction level parallelism (page 324, left column, 2nd paragraph, page 332, left column, 3rd paragraph).

11. Regarding **claim 7**, Ungerer discloses a multi-threading processor comprising:

a first instruction decode unit coupled between the first instruction fetch unit and the multi-thread scheduler (page 334, left column - page 335, right column, 2nd paragraph); and

a second instruction decode unit coupled between the second instruction fetch unit and the multi-thread scheduler (page 334, left column - page 335, right column, 2nd paragraph).

12. Regarding **claim 8**, as modified Eggers discloses the execution unit executes only two threads in parallel (page 324, left column, 2nd paragraph, page 335, left column 3rd paragraph).

13. **Claims 9 – 14 and 16 - 20** are rejected on the same ground as stated in claims 1 – 8 above.

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Response to Arguments

14. Applicant's arguments with respect to claims 1, 3, 9, 11, 15 and 17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilian Vo whose telephone number is 571-272-3774. The examiner can normally be reached on Thursday 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lilian Vo
Examiner
Art Unit 2195

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April 13, 2006


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